

Biological purification for treating sewage

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Abstract

Purifying effluent using biological methods and optionally physical and/or chemical process involves 1-2 biological cleaning steps including: (a) degrading carbon under aerobic conditions to give a CSB value of 60-80 (preferably 70-75) % CSB and 70-90 (preferably 75-85) % BSB5 and (b) nitrification to reduce the ammonium nitrogen content in the effluent at the end of the process to < 10 mg/l. Also claimed is a purification apparatus comprising a reactor (1) containing a vertical feed pipe (7) positioned concentrically relative to the reactor mantle. Contaminated effluent is supplied through a nozzle (3) extending into the top end of the pipe. A second reactor contains carrier materials for immobilising microorganisms, preferably packing material with a specific surface area of 150-230 m²/m³. Preferably, the dwell time for step (a) is 0.25-0.5 (preferably 0.33) hours and for step (b) it is 1.2-3 (preferably 2) hours. Bacteria concentration in step (b) is 7-20 kg/cm³. The specific bacteria growth rate in steps (a) and (b) is 60-90 % of the total growth rate. Effluent from step (a) has a BSB5 concentration of 30-100 (preferably 60) mg/l and the ammonium nitrogen content of the effluent for step (b) is 2-20 (< 10) mg/l. Effluent supplied to step (a) has a CSB/BSB5 ratio of 1.5-3 (2). The BSB5/N ratio of effluent supplied to step (b) is 0.5-2.5 (1). A loop reactor is used for step (a) and a solid or fluidised bed reactor is used for step (b).

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